AMENDMENTS TO THE SPECIFICATION

Please replace the paragraph that begins at page 2, line 12 with the following amended paragraph:

As one type of filter component, TEM dual-mode dielectric waveguide filters are known (A. C. Kundu and I. Awai, "Low-Profile Dual-Mode BPF Using Square Dielectric Disk Resonator," Proceedings of the 1997 Chugoku-region Autumn Joint Conference of 5 Institutes, Hiroshima, Japan, Oct. 1997, [[P]]page 272). Since the TEM dual-mode dielectric waveguide filter[[s]] acts as two resonators, i.e., two different modes of the resonator have the same resonant frequency, it can be used as a small and high performance bandpass filter.

Please replace the paragraph that begins at page 2, line 20 with the following amended paragraph:

However, since the TEM dual-mode dielectric waveguide filter of the above-mentioned type is electrically connected to a printed circuit board by [[the]] wires, there is [[a]] the problem that it occupies a relatively wide area. Further, since the electrodes to which the wires are to be connected are disposed on the side surfaces of the dielectric block, for thin types it is difficult to obtain sufficient external circuit coupling and/or it is difficult to perform a wire bonding.

Please replace the paragraph that begins at page 2, line 27, with the following amended paragraph:

Moreover, since the TEM dual-mode dielectric waveguide filter of the above-mentioned type has the removed portion on the metal plate which is floating for controlling the coupling, there is the further problem that the radiation loss increases with increasing the area of the removed portion so as to enhance the coupling.

Please replace the paragraph that begins at page 3, line 11, with the following amended paragraph:

A [[F]]further object of the present invention is to provide a TEM dual-mode dielectric waveguide bandpass filter which requires a small area for mounting.

Please replace the paragraph that begins at page 3, line 14, with the following amended paragraph:

A [[S]]still further object of the present invention is to provide a TEM dual-mode dielectric waveguide bandpass filter having sufficient external circuit coupling.

Please replace the paragraph that begins at page 3, line 17, with the following amended paragraph:

A [[S]]still further object of the present invention is to provide a TEM dual-mode dielectric waveguide bandpass filter in which the radiation loss is decreased.

Please replace the paragraph that begins at page 3, line 20, with the following amended paragraph:

The above and other objects of the present invention can be accomplished by a bandpass filter of dual[[-]]_modes comprising a dielectric block having a top surface, a bottom surface and first to fourth side surfaces, a first metal plate to be in a floating state substantially entirely formed on the top surface of the dielectric block, a second metal plate to be grounded formed on the bottom surface of the dielectric block, and means for providing a coupling between the dual[[-]]_modes.

Please replace the paragraph that begins at page 4, line 15, with the following amended paragraph:

According to this preferred aspect of the present invention, because the exciting electrodes are disposed on the bottom surface of the dielectric block, the thickness there of the dielectric block and the area for mounting can be reduced. Moreover, because [[the]]

sufficient external circuit coupling can be obtained, a very thin shape and broadband operation can be achieved simultaneously.

Please replace the paragraph that begins at page 4, line 26, with the following amended paragraph:

The above and other objects of the present invention can be also accomplished by a bandpass filter of dual[[-]]mode comprising a dielectric block having a top surface, a bottom surface and first to fourth side surfaces, a first metal plate formed on the top surface of the dielectric block, a second metal plate formed on the bottom surface of the dielectric block, first and second exciting electrodes formed on the bottom surface of the dielectric block, and means for providing a coupling between the dual[[-]]modes.

Please replace the paragraph that begins at page 5, line 7, with the following amended paragraph:

According to the present invention, because the exciting electrodes are disposed on the bottom surface of the dielectric block, the thickness there of the dielectric block and the area for mounting can be reduced. Moreover, because [[the]] sufficient external circuit coupling can be obtained, a very thin shape and broadband operation can be achieved simultaneously.

Please replace the paragraph that begins at page 5, line 26, with the following amended paragraph:

Figure 1 is a schematic perspective view from a top side showing a bandpass filter 10 that is a preferred embodiment of the present invention.

Please replace the paragraph that begins at page 6, line 1, with the following amended paragraph:

Figure 2 is a schematic plan view from a bottom side showing the bandpass filter 10.

Please replace the paragraph that begins at page 6, line 24, with the following amended paragraph:

Figure 11 is a schematic plan view showing ~~the example that~~ an exemplary embodiment in which the removed portion 16 is positioned at the upper[[-]] right of the metal plate 13.

Please replace the paragraph that begins at page 6, line 26, with the following amended paragraph:

Figure 12 is a schematic plan view showing ~~the example that~~ an exemplary embodiment in which the removed portion 16 is positioned at the lower[[-]] left of the metal plate 13.

Please replace the paragraph that begins at page 7, line 1, with the following amended paragraph:

Figure 13 is a schematic plan view showing ~~the example that~~ an exemplary embodiment in which the removed portion 16 is positioned at the lower[[-]] right of the metal plate 13.

Please replace the paragraph that begins at page 7, line 3, with the following amended paragraph:

Figure 14 is a schematic plan view showing ~~the example that~~ an exemplary embodiment in which the removed portion 16 is in the form of a sector ~~form~~.

Please replace the paragraph that begins at page 7, line 5, with the following amended paragraph:

Figure 15 is a schematic plan view showing ~~the example that~~ an exemplary embodiment in which the removed portion 16 is ~~a~~ rectangular.

Please replace the paragraph that begins at page 7, line 7, with the following amended paragraph:

Figure 16 is a schematic plan view showing ~~the example that~~ an exemplary embodiment in which the removed rectangular portion 16 ~~of rectangular~~ is positioned at an inner location of the metal plate 13.

Please replace the paragraph that begins at page 7, line 10, with the following amended paragraph:

Figure 17 is a schematic plan view showing ~~the example that~~ an exemplary embodiment in which the removed portion 16 [[of]] is circular and is positioned at an inner location of the metal plate 13.

Please replace the paragraph that begins at page 7, line 12, with the following amended paragraph:

Figure 18 is a schematic plan view showing ~~the example that~~ an exemplary embodiment in which two removed portions 16 are employed.

Please replace the paragraph that begins at page 7, line 14, with the following amended paragraph:

Figure 19 is a schematic plan view showing another ~~example that~~ exemplary embodiment in which two removed portions 16 are employed.

Please replace the paragraph that begins at page 7, line 16, with the following amended paragraph:

Figure 20 is a schematic perspective view from a top side showing a bandpass filter 50 that is another preferred embodiment of the present invention.

Please replace the paragraph that begins at page 7, line 19, with the following amended paragraph:

Figure 21 is a schematic plan view from a bottom side showing the bandpass filter 50.

Please replace the paragraph that begins at page 7, line 26, with the following amended paragraph:

Figure 24 is a schematic plan view from a bottom side showing the bandpass filter 50, where the length *l* of the edge of the coupling control stub 56 is 0.36 mm.

Please replace the paragraph that begins at page 8, line 2, with the following amended paragraph:

Figure 25 is a graph showing the frequency characteristic curve of the bandpass filter 50 shown in Figure 24.

Please replace the paragraph that begins at page 8, line 4, with the following amended paragraph:

Figure 26 is a schematic plan view showing ~~the example that~~ an exemplary embodiment in which the coupling control stub 56 is [[a]] triangular.

Please replace the paragraph that begins at page 8, line 6, with the following amended paragraph:

Figure 27 is a schematic plan view showing ~~the example that~~ an exemplary embodiment in which the coupling control stub 56 is [[a]] circular.

Please replace the paragraph that begins at page 8, line 8, with the following amended paragraph:

Figure 28 is a schematic plan view showing ~~the example that~~ an exemplary embodiment in which both [[the]] a coupling control stub 56 and [[the]] removed portions 16 are employed.

Please replace the paragraph that begins at page 8, line 13, with the following amended paragraph:

Figure 30 is a schematic plan view from a bottom side showing the bandpass filter 60.

Please replace the paragraph that begins at page 8, line 15, with the following amended paragraph:

Figure 31 is a graph showing the frequency characteristic curve of the bandpass filter 60 shown in Figures 29 and 30.

Please replace the paragraph that begins at page 8, line 17, with the following amended paragraph:

Figure 32 is a schematic perspective view from a top side showing a bandpass filter 70 that is a further preferred embodiment of the present invention.

Please replace the paragraph that begins at page 8, line 20, with the following amended paragraph:

Figure 33 is a schematic plan view from a bottom side showing a [[the]] bandpass filter 70.

Please replace the paragraph that begins at page 8, line 22, with the following amended paragraph:

Figure 34 is a schematic plan view from a top side showing a bandpass filter 80 that is a further preferred embodiment of the present invention.

Please replace the paragraph that begins at page 8, line 25 with the following amended paragraph:

Figure 35 is a schematic plan view from a bottom side showing a [[the]] bandpass filter 80.

Please replace the paragraph that begins at page 9, line 4, with the following amended paragraph:

Figure 1 is a schematic perspective view from a top side showing a bandpass filter 10 that is a preferred embodiment of the present invention. Figure 2 is a schematic plan view from a bottom side showing the bandpass filter 10.

Please replace the paragraph that begins at page 9, line 9, with the following amended paragraph:

As shown in Figures 1 and 2, a bandpass filter 10 that is a preferred embodiment of the present invention is constituted of a dielectric block 11 and various metal plates formed on the surface thereof. The dielectric block 11 is made of dielectric material whose dielectric constant is 33, ($\varepsilon_r = 33$), and has the shape of a rectangular prism whose length, width, and thickness are 5.3 mm, 5.3 mm, and 0.5 mm, respectively. That is, the dielectric block 11 has no holes or surface irregularities.

Please replace the paragraph that begins at page 10, line 3, with the following amended paragraph:

As shown in Figure 2, the metal plate 13 and the exciting electrode 14 are prevented from contacting each other by a 0.2 mm gap. Similarly, the metal plate 13 and the exciting electrode 15 are prevented from contacting each other by a 0.2 mm gap.

Please replace the paragraph that begins at page 1, line 10, with the following amended paragraph:

In [[the]] a TEM dual-mode rectangular-planar dielectric waveguide resonator 20 having the above-described structure has two propagation directions, i.e., along the *x*- and *y*-directions. Since the length along the *x*-direction and the length along the *y*-direction of the dielectric block 21 are the same ~~as each other~~, dominant resonant frequencies based on the propagation along the *x*-direction and the *y*-direction are substantially coincident. Therefore, the TEM dual-mode rectangular planar dielectric waveguide resonator 20 acts as

two resonators (dual[[-]]_modes) having the same dominant resonant frequency from an electrical point of view. However, since there is no coupling between the dual[[-]]_modes, the TEM dual-mode rectangular-planar dielectric waveguide resonator 20 does not act as a filter.

Please replace the paragraph that begins at page 11, line 21, with the following amended paragraph:

Coupling between the dual[[-]]_modes can be provided by destroying the symmetry of the resonator structure of each mode in order for ~~to acts~~ the TEM dual-mode rectangular-planar dielectric waveguide resonator 20 to act as a filter.

Please replace the paragraph that begins at page 12, line 1, with the following amended paragraph:

As shown in Figure 4, the symmetry of the resonator structure of each mode can be ~~destroyed~~ affected by forming the removed portion 24 by removing a part of the metal plate 23 formed on the bottom surface of the dielectric block 21. It is preferable to locate the removed portion 24 at the corner of the metal plate 23 as shown in Figure 4. Because the symmetry of the resonator structure of each mode is greatly destroyed with increasing the area of the removed portion 24, the coupling between the dual[[-]]_modes increases ~~with increasing~~ as the area of the removed portion 24 is increased. As is set out above, a filter function can be added to the TEM dual-mode rectangular-planar dielectric waveguide resonator 20 by forming the removed portion 24 on the metal plate 23 to thereby destroy the symmetry of the resonator structure of each mode.

Please replace the paragraph that begins at page 12, line 18, with the following amended paragraph:

As shown in Figure 5, the capacitor 30 is constituted of a dielectric block 31 whose thickness is t, a metal plate 32 formed on the entire top surface of the dielectric block 31 and a metal plate 33 formed on the entire bottom surface of the dielectric block 31. The metal

plate 32 formed on the top surface of the dielectric block 31 is a metal plate to be connected to the metal plate 22 formed on the top surface of the dielectric block 21. The metal plate 33 formed on the bottom surface of the dielectric block 31 is the exciting electrode. The [[R]] remaining four side surfaces are open to the air.

Please replace the paragraph that begins at page 13, line 7, with the following amended paragraph:

Figure 6 is a conceptual diagram to form the bandpass filter 10 by combining the TEM dual-mode rectangular-planar dielectric waveguide resonator 20, and the capacitor 30 and a spacer 40. It is worth noting that Figure 6 is a conceptual diagram so that the bandpass filter 10 is not actually fabricated by ~~combine~~ combining the physical components of the resonator 20, the capacitor 30 and the spacer 40. Actually, the bandpass filter 10 can be fabricated by metallizing the top and bottom surfaces of the dielectric block 11 as a single component.

Please replace the paragraph that begins at page 13, line 14, with the following amended paragraph:

As shown in Figure 6, in the bandpass filter 10 by conceptually combining the components of the resonator 20, the capacitor 30 and the spacer 40, the radiation loss from the top surface of the dielectric block is small because the top surface of the dielectric block is entirely covered with the metal plate. The structure of the bottom surface is already shown in Figure 2. Specifically, the metal plate 23 shown in Figure 4 ~~is used as~~ corresponds to the metal plate 13, the metal plates 33 shown in Figure 5 ~~is used as~~ correspond to the exciting electrodes 14 and 15.

Please replace the paragraph that begins at page 13, line 21, with the following amended paragraph:

This is the principle of the bandpass filter 10. When the bandpass filter 10 is mounted on [[the]] a printed circuit board, the metal plate 13 of the bandpass filter 10 is directly

connected to the ground electrode formed on the printed circuit board by [[a]] solder or the like, and the exciting electrodes 14 and 15 of the bandpass filter 10 are [[is]] directly connected to the input/output electrodes formed on the printed circuit board by [[a]] solder or the like. That is, the bandpass filter 10 of this embodiment can be used as a SMD (Surface Mount Device). Thus, this embodiment makes the thickness of the bandpass filter 10 small and makes the area required for mounting the bandpass filter 10 correspondingly small.

Please replace the paragraph that begins at page 14, line 17, with the following amended paragraph:

However, the overall size of the bandpass filter 10 increases with increasing the surface area ***A***. Therefore, in order to increase the external circuit coupling capacitance ***C***, it is preferable to decrease the thickness ***t*** of the dielectric block 11 ~~is effective~~. Decreasing the thickness ***t*** of the dielectric block 11 means decreasing the thickness of the bandpass filter 10.

Please replace the paragraph that begins at page 14, line 23, with the following amended paragraph:

According to this embodiment, a very thin (0.5 mm) dielectric block 11 is used and the ~~exciting electrodes 14 and 15 are disposed on the bottom surface of the dielectric block 11~~ taking the above-described into consideration.

Please replace the paragraph that begins at page 15, line 5, with the following amended paragraph:

As shown in Figure 7, the difference between the even mode resonant frequency f_{even} and the odd mode resonant frequency $\mathbf{f_{odd}}$ increases with increasing the length ***d*** of the edge of the removed portion 16, whereas the even mode resonant frequency f_{even} and the odd mode resonant frequency $\mathbf{f_{odd}}$ are the same when the length **d** is 0 mm, i.e., without the removed

portion. This means that the symmetry of the resonator structure of each mode ~~destroys with~~ is affected by increasing the length ***d*** of the edge of the removed portion 16.

Please replace the paragraph that begins at page 15, line 13, with the following amended paragraph:

Further, although the even mode resonant frequency f_{even} has very little dependence upon the length ***d*** of the edge of the removed portion 16, the odd mode resonant frequency f_{odd} markedly increases ~~with increasing~~ when the length ***d*** is increased. This implies that the coupling between dual[[-]] modes caused by the removed portion 16 is inductive.

Please replace the paragraph that begins at page 15, line 18, with the following amended paragraph:

The coupling constant ***k*** between the dual[[-]] modes can be represented by the following equation.

$$k = \frac{f_{even}^2 - f_{odd}^2}{f_{even}^2 + f_{odd}^2} \qquad (2)$$

Please replace the paragraph that begins at page 16, line 2, with the following amended paragraph:

As is apparent from Figure 8, the coupling constant ***k*** exponentially increases with increasing length ***d*** of the edge of the removed portion 16, whereas the coupling constant ***k*** is zero when the length ***d*** is 0 mm, i.e., without any removed portion. Thus, a desired coupling constant ***k*** can be obtained by controlling the length ***d*** of the edge of the removed portion 16. In order to obtain [[the]] a coupling constant ***k*** ~~being~~ of 0.036, the length ***d*** of the edge of the removed portion 16 should be 1.41 mm. In this case, an external quality factor becomes about 27.

Please replace the paragraph that begins at page 16, line 10, with the following amended paragraph:

Figure 9 is a schematic plan view from a bottom side showing the bandpass filter 10 where the length ***d*** of the edge of the removed portion 16 is 1.41 mm. Figure 10 is a graph showing the frequency characteristic curve of the bandpass filter 10 shown in Figure 9.

Please replace the paragraph that begins at page 16, line 14, with the following amended paragraph:

In Figure 10, S11 represents a reflection coefficient, and S21 represents a transmission coefficient. As shown in Figure 10, the center resonant frequency of the bandpass filter 10 shown in Figure 9 is approximately 5.8 GHz and its 3-dB bandwidth is approximately 280 MHz. According to the bandpass filter 10 of this embodiment, a very wide bandwidth can be obtained. Further, attenuation poles appear at approximately 4.1 GHz and 5.2 GHz in the lower side of the passing band; and an attenuation pole appears at approximately 6.3 GHz in the higher side of the passing band. Therefore, both of the lower and higher edges of the passing band of the frequency characteristics are sharpened.

Please replace the paragraph that begins at page 17, line 1, with the following amended paragraph:

That is, the bandpass filter 10 can be used as a SMD so that the area required for mounting ~~thereof~~ can be reduced. Therefore, in the bandpass filter 10 according to this embodiment, a very thin shape and broadband operation can be achieved simultaneously.

Please replace the paragraph that begins at page 17, line 5, with the following amended paragraph:

Further, according to the bandpass filter 10 of the present invention, because the metal plate 12 is formed on the top surface of the dielectric block 11 and the thickness of the dielectric

block 11 is small, the radiation loss can be reduced. T[[t]]herefore, a high unloaded quality factor (Q_0) can be obtained.

Please replace the paragraph that begins at page 17, line 9, with the following amended paragraph:

Moreover, according to the bandpass filter 10, because the attenuation poles appear at both the higher side and the lower side, a sharp frequency characteristic[[s]] can be obtained.

Please replace the paragraph that begins at page 17, line 12, with the following amended paragraph:

In this embodiment, although the removed portion 16 is positioned at the corner 11ab of the edge 11a and 11b, ~~it is not limited that~~ the removed portion 16 ~~is positioned at the corner 11ab but it~~ can be positioned at another portion.

Please replace the paragraph that begins at page 17, line 16, with the following amended paragraph:

Figures 11 to 13 are schematic plan views showing ~~the example that~~ an exemplary embodiment wherein the removed portion 16 is positioned at another corner. The removed portion 16 is positioned at the upper[[-]]right of the metal plate 13 in Figure 11, at the lower[[-]]left of the metal plate 13 in Figure 12, and at the lower[[-]]right of the metal plate 13 in Figure 13. The coupling between ~~dual-mode~~ the dual modes is also provided in ~~example shown in~~ the exemplary embodiments of Figures 11 to 13 because the symmetry of the resonator structure of each mode is destroyed by the removed portion 16.

Please replace the paragraph that begins at page 17, line 24, with the following amended paragraph:

Further, in [[this]] these embodiments, although the removed portion16 is triangular, ~~it is not limited that~~ the removed portion 16 ~~is triangular but it~~ can be another shape ~~insofar~~ whereby the symmetry of the resonator structure of each mode is destroyed.

Please replace the paragraph that begins at page 18, line 1, with the following amended paragraph:

Figures 14 and 15 are schematic plan views showing ~~the example that~~ an exemplary embodiment of the present invention inventory in which the removed portion 16 has another shape. In Figure 14, the removed portion 16 is a sector ~~form~~; in Figure 15, the removed portion 16 is [[a]] rectangular. The coupling between ~~dual-mode~~ the dual modes is also provided in the examples shown in Figures 14 and 15, because the symmetry of the resonator structure of each mode is destroyed by the removed portion 16.

Please replace the paragraph that begins at page 18, line 7, with the following amended paragraph:

Moreover, in [[this]] these embodiments, although the removed portion 16 is positioned at the corner of the metal plate 13, ~~it is not limited that~~ the removed portion 16 ~~is positioned at the corner but~~ can be positioned at another portion ~~insofar as~~ whereby the symmetry of the resonator structure of each mode is destroyed.

Please replace the paragraph that begins at page 18, line 12, with the following amended paragraph:

Figures 16 and 17 are schematic plan views showing ~~the example that~~ an exemplary embodiment of the present invention in which the removed portion 16 is positioned at an inner location of the metal plate 13. In Figure 16, the rectangular removed portion 16 is positioned at an inner location of the metal plate 13 close to the upper[[-]] left corner; in Figure 17, the circular removed portion 16 ~~of circular~~ is positioned at an inner location of the metal plate 13 close to the lower[[-]] left corner. The coupling between ~~dual-mode~~ the dual modes is also provided in the examples shown in Figures 16 and 17, because the symmetry of the resonator structure of each mode is destroyed by the removed portion 16.

Please replace the paragraph that begins at page 18, line 21, with the following amended paragraph:

Furthermore, in this embodiment, although only one removed portion 16 is formed, ~~it is not limited that~~ the number of [[the]] removed portion 16 ~~is one but the number of the removed portions 16~~ can be a plurality ~~insofar as~~ of removed portions whereby the symmetry of the resonator structure of each mode is destroyed.

Please replace the paragraph that begins at page 18, line 26, with the following amended paragraph:

Figures 18 and 19 are schematic plan views showing ~~the example that the~~ an exemplary embodiment of the present invention in which a plurality of removed portions 16 are formed on the metal plate 13.

Please replace the paragraph that begins at page 19, line 1, with the following amended paragraph:

In Figure 18, two rectangular removed portions 16-1 and 16-2 ~~of triangular~~ are positioned at the upper[[-]]left corner and the lower[[-]]right corner, respectively; in Figure 19, two rectangular removed portions 16-3 and 16-4 ~~of rectangular~~ are positioned at the upper[[-]]right and lower[[-]]left corner, respectively. The inductive coupling and capacitive coupling between the dual[[-]]modes [[are]] is also provided in the examples shown in Figures 18 and 19, respectively, because the symmetry of the resonator structure of each mode is destroyed by the removed portions 16-1 to 16-4.

Please replace the paragraph that begins at page 19, line 11, with the following amended paragraph:

Figure 20 is a schematic perspective view from a top side showing a bandpass filter 50 that is another preferred embodiment of the present invention. Figure 21 is a schematic plan view from a bottom side showing the bandpass filter 50.

Please replace the paragraph that begins at page 19, line 15, with the following amended paragraph:

As shown in Figures 20 and 21, the bandpass filter 50 that is another preferred embodiment of the present invention is constituted of a dielectric block 51 and various metal plates formed on the surface thereof. The dielectric block 51 ~~is the same as~~ corresponds to the dielectric block 11 used in the bandpass filter 10 of above-described embodiment. Thus, the dielectric block 51 is made of dieletric material whose dielectric constant, $\varepsilon_r = 33$, and has the shape of a rectangular prism whose length, width, and thickness are 5.3 mm, 5.3 mm and 0.5 mm, respectively.

Please replace the paragraph that begins at page 19, line 23, with the following amended paragraph:

A metal plate 52 is formed on the top surface of the dielectric block 51. A metal place 53, exciting electrodes 54 and 55, and a coupling control stub 56 are formed on the bottom surface of the dielectric block 51. As shown in Figure 21, the dimensions of the metal plate 53 is 4.6 mm x 4.6 mm square along the edge 51a and the edge 51b adjacent to the edge 51a of the bottom surface of the dielectric block 51. No removed portion is formed on the metal plate 53 different from the bandpass filter 10. The exciting electrode 54 is located along the edge 51a and the edge 51c opposite to the edge 51b and the dimensions of the exciting electrode 54 ~~measures~~ are 0.5 mm x 4.2 mm rectangular. The exciting electrode 55 is located along the edge 51b and the edge 51d opposite to the edge 51a and the dimensions of the exciting electrode 55 measures 0.5 mm x 4.2 m rectangular.

Please replace the paragraph that begins at page 20, line 9, with the following amended paragraph:

The coupling control stub 56 is located adjacent [[at]] the corner 51cd of the edge 51c and edge 51d, being in contact with the metal plate 53. The dimensions of the coupling control stub 56 measures 0.4 mm x 1 rectangular.

Please replace the paragraph that begins at page 20, line 13, with the following amended paragraph:

The metal plate 53 and the exciting electrode 54 are prevented from contacting each other by a 0.2 mm gap. Similarly, the metal plate 53 and the exciting electrode 55 are prevented from contacting each other by a 0.2 mm gap. No metal plate or electrode is formed on the remaining surfaces of the dielectric block 51, which therefore constitute open ends.

Please replace the paragraph that begins at page 20, line 23, with the following amended paragraph:

According to the above described structure, although the bandpass filter 50 of this preferred embodiment acts as a TEM dual-mode rectangular-planar dielectric waveguide bandpass filter, the symmetry of the resonator structure of each mode is destroyed by the coupling control stub 56. In other words, the coupling control stub 56 gives coupling between the dual[[-]] modes. The coupling between the dual[[-]] modes increases with increasing the area of the coupling control stub 56, because the magnitude of the ~~destroying the~~ destruction of symmetry increases ~~with increases~~ as the area of the coupling control stub 56 increases.

Please replace the paragraph that begins at page 21, line 8, with the following amended paragraph:

As shown in Figure 22, the difference between the even mode resonant frequency f_{even} and the odd mode resonant frequency f_{odd} increases ~~with increasing~~ as the length l of the coupling control stub 56 increases, whereas the even mode resonant frequency f_{even} and the odd mode resonant frequency f_{odd} are the same when the length l is 0 mm, i.e., without the coupling control stub. This means that the symmetry of the resonator structure of each mode ~~destroys with~~ is affected by increasing the length l of the coupling control stub 56.

Please replace the paragraph that begins at page 21, line 16, with the following amended paragraph:

Further, although the odd mode resonant frequency f_{odd} has very little dependence upon the length *l* of the coupling control stub 56, the even mode resonant frequency f_{even} markedly decreases ~~with increasing~~ as the length *l* increases. This implies that the coupling between the dual[[-]] modes caused by the coupling control stub 56 is capacitive.

Please replace the paragraph that begins at page 21, line 21, with the following amended paragraph:

The coupling constant *k* between the dual[[-]] modes can be represented by the equation (2) ~~explained~~ described earlier.

Please replace the paragraph that begins at page 21, line 25, with the following amended paragraph:

As is apparent from Figure 23, the coupling constant *k* linearly increases with increasing length *l* of the coupling control stub 56, whereas the coupling constant *k* is zero when the length *l* is 0 mm, i.e., without a coupling control stub. Thus, a desired coupling constant *k* can be obtained by controlling the length *l* of the coupling control stub 56. In order to obtain ~~the~~ a coupling constant *k* ~~being~~ of 0.032, the length *l* of the coupling control stub 56 should be 0.36 mm.

Please replace the paragraph that begins at page 22, line 5, with the following amended paragraph:

Figure 24 is a schematic plan view from a bottom side showing the bandpass filter 50, where the length *l* of the edge of the coupling control stub 56 is 0.36 mm. Figure 25 is a graph showing the frequency characteristic curve of the bandpass filter 50 shown in Figure 24.

Please replace the paragraph that begins at page 22, line 9, with the following amended paragraph:

In Figure 25, S11 represents a reflection coefficient, and S21 represents a transmission coefficient. As shown in Figure 25, the center resonant frequency of the bandpass filter 50 shown in Figure 24 is approximately 5.66 Ghz and its 3-dB bandwidth is approximately 250 MHz. Thus, according to the bandpass filter 50 of this embodiment, a very wide bandwidth can be obtained. Further, an attenuation pole appears at approximately 4.4 GHz, so that the lower edge of the passing band of the frequency characteristics is sharpened.

Please replace the paragraph that begins at page 22, line 17, with the following amended paragraph:

The bandpass filer 50 has ~~effects not only the effects obtained by the bandpass filter 10 of the above described embodiment but also an~~ the effect that the radiation loss is more effectively reduced.

Please replace the paragraph that begins at page 22, line 20, with the following amended paragraph:

In this embodiment, although the coupling control stub 56 is rectangular, ~~it is not limited that~~ the coupling control stub 56 ~~is rectangular but it~~ can be another shape ~~insofar as~~ whereby the symmetry of the resonator structure of each mode is destroyed.

Please replace the paragraph that begins at page 22, line 24, with the following amended paragraph:

Figures 26 and 27 are schematic plan views showing ~~the example that~~ an exemplary embodiment of the present invention wherein the coupling control stub 56 has another shape. In Figure 26, the coupling control stub 56 is [[a]] triangular; in Figure 27, the coupling control stub 56 is [[a]] circular. The coupling between the dual[[-]] modes is also provided in the example shown in Figures 26 and 27 because the symmetry of the resonator structure of each mode is ~~destroyed~~ affected by the coupling control stub 56.

Please replace the paragraph that begins at page 23, line 4, with the following amended paragraph:

Further, in [[this]] these embodiments, although the symmetry of the resonator structure of each mode is destroyed by only using the coupling control stub 56, the removed portion 16 shown in Figures 9 and 11 to 19 can be employed in addition.

Please replace the paragraph that begins at page 21, line 8, with the following amended paragraph:

Figure 28 is a schematic plan view showing an exemplary embodiment of the present invention wherein ~~the example that~~ both [[the]] a coupling control stub 56 and [[the]] removed portions 16 are employed. In the example shown in Figure 28, the rectangular coupling control stub 56 ~~of rectangular~~ is formed and the triangular removed portions 16 ~~of triangular is~~ are formed [[on]] at the upper[[-]] right corner of the metal plate 53. The capacitive coupling between the dual[[-]] modes is also provided in the ~~example~~ exemplary embodiment shown in Figure 28, because the symmetry of the resonator structure of each mode is ~~destroyed~~ affected by the coupling control stub 56 and the removed portions 16.

Please replace the paragraph that begins at page 23, line 16, with the following amended paragraph:

~~A further preferred embodiment of the present invention will now be explained~~ described.

Please replace the paragraph that begins at page 23, line 18, with the following amended paragraph:

Figure 29 is a schematic perspective view from a top side showing a bandpass filter 60 that is a further preferred embodiment of the present invention. Figure 30 is a schematic plan view from a bottom side showing the bandpass filter 60.

Please replace the paragraph that begins at page 23, line 22, with the following amended paragraph:

As shown in Figures 29 and 30, the bandpass filter 60 that is a further preferred embodiment of the present invention is constituted of a dielectric block 61 and various metal plates formed on the surfaces thereof. The dielectric block 61 ~~is the same as~~ corresponds to the dielectric bocks 11 and 51 used in the bandpass filters 10 and 60 of above-described embodiments. Thus, the dielectric block 61 is made of a dielectric material whose dielectric constant ε_r=33, and has the shape of a rectangular prism whose length, width, and thickness are 5.3 mm, 5.3 mm, and 0.5 mm, respectively.

Please replace the paragraph that begins at page 24, line 3, with the following amended paragraph:

A metal plate 62 is formed on the top surface of the dielectric block 61. A metal plate 63 and exciting electrodes 64 and 65 are formed on the bottom surface of the dielectric block 61. As shown in Figure 30, the dimensions of the metal plate 63 [[is]] are 4.6 mm x 4.6 mm square along the edge 61a, and the edge 61b adjacent to the edge 61a of the bottom surface of the dielectric block 61 ~~having~~ have a triangular removed portion 66 ~~of triangular~~ positioned at the corner 61ab formed by the edges 61a and 61b similar to the bandpass filter 10. As shown in Figure 30, the exciting electrode 64 is located along the edge 61c opposite to the edge 61b and the dimensions of the exciting electrode 64 ~~measures~~ are 0.5 mm. x 2.6 mm rectangular. The exciting electrode 65 is located along the edge 61d opposite to the edge 61a and the dimensions of the exciting electrode 65 ~~measures~~ are 0.5 mm x 2.6 mm rectangular. Further, the exciting electrode 64 is apart from the edge 61a, and the exciting electrode 65 is apart from the edge 61b, ~~different from~~ in contrast to the above described embodiments. As shown in Figure 30, the distances between the exciting electrode 64 and the edge 61a and the exciting electrode 65 and the edge 61b are defined by clearance ***s***.

Please replace the paragraph that begins at page 24, line 20, with the following amended paragraph:

The metal plate 63 and the exciting electrode 64 are prevented from contacting each other by a 0.2 mm gap. Similarly, the metal plate 63 and the exciting electrode 65 are prevented from contacting each other by a 0.2 mm gap. No metal plate or electrode is formed on the remaining surfaces of the dielectric block 61[[,]] which, therefore, constitute open ends.

Please replace the paragraph that begins at page 24, line 25, with the following amended paragraph:

In actual use, the metal plate 62 formed on the top surface of the dielectric block 61 is floating and the metal plate 63 formed on the bottom surface of the dieletric block 61 is grounded, similar to the bandpass filter 10. One of the exciting electrodes 64 and 65 is used as an input electrode, and the other is used as an output electrode.

Please replace the paragraph that begins at page 25, line 3, with the following amended paragraph:

Figure 31 is a graph showing the frequency characteristic curve of the bandpass filter 60 shown in Figures 29 and 30.

Please replace the paragraph that begins at page 25, line 5, with the following amended paragraph:

In Figure 31, S11 represents a reflection coefficient, and S21 represents a transmission coefficient. As shown in Figure 31, the frequencies of the attenuation poles drastically vary with changing clearance ***s***, whereas the center resonant frequency of the bandpass filter 60 and its 3-dB bandwidth do not substantially vary with changing clearance ***s***. Specifically, the frequencies of the attenuation poles shift high with increasing the clearance ***s***, the frequencies of the attenuation poles shift low with decreasing the clearance ***s***. Further, the attenuation level at the lower attenuation band decreases and the attenuation level at the higher attenuation band increases with increasing the clearance ***s***, the attenuation level at the

lower attenuation band increases and the attenuation level at the higher attenuation band decreases with decreasing the clearance ***s***. This phenomenon is caused by the fact that a direct coupling between the exciting electrodes 64 and 65 increases with increasing the clearance ***s***. Thus, the clearance ***s*** should be controlled based on a desired characteristic[[s]].

Please replace the paragraph that begins at page 25, line 21, with the following amended paragraph:

The bandpass filter 60 has effects not only ~~the effects obtained~~ achievably by the bandpass filter 10 of the above-described embodiment but also an effect that the characteristics at the attenuation band can be controlled by the afore-described simple method.

Please replace the paragraph that begins at page 25, line 25, with the following amended paragraph:

In this embodiment, although the triangular removed portion 66 ~~of triangular~~ is formed on the upper[[-]] left corner of the metal plate 63, the position, shape and number of the removed portion 66 are not limited to those of this as was explained with reference to Figures 11 to 19.

Please replace the paragraph that begins at page 26, line 2, with the following amended paragraph:

Further, in this embodiment, although the symmetry of the resonator structure of each mode is destroyed by using the removed portion 66, the symmetry also can be destroyed by using [[the]] a coupling control stub similar to that discussed in connection with the bandpass filter 50 shown in Figures 20 and 21.

Please replace the paragraph that begins at page 26, line 6, with the following amended paragraph:

A further preferred embodiment of the present invention will now be ~~explained~~ described.

Please replace the paragraph that begins at page 26, line 8, with the following amended paragraph:

Figure 32 is a schematic perspective view from a top side showing a bandpass filter 70 that is a further preferred embodiment of the present invention. Figure 33 is a schematic plan view from a bottom side showing the bandpass filter 70.

Please replace the paragraph that begins at page 26, line 12, with the following amended paragraph:

As is shown in Figures 32 and 33, the bandpass filter 70 that is a further preferred embodiment of the present invention is constituted of a dielectric block 71 and various metal plates formed on the surface thereof. The dielectric block 71 ~~is the same as~~ corresponds to the dielectric blocks 11, 51, and 61 used in the bandpass filters 10, 50 and 60 of the above-described embodiments, except that the corner formed by the top surface and the adjacent two side surfaces thereof is removed. A rectangular surface 76 ~~of rectangular~~ is formed at the removed corner. An edge 76a is formed on one side surface of the dielectric block 71 and an edge 76b is formed on the other side surface of the dielectric block 71, both of which have the same length.

Please replace the paragraph that begins at page 27, line 5 with the following amended paragraph:

Because, as described above, in the bandpass filter 70 according to this embodiment, the corner of the dielectric block 71 is removed so as to destroy the symmetry of the resonator structure of each mode, ~~similar~~ effects [[of]] similar to the above-described embodiments can be obtained. It is worth noting that the removed portion on the metal plate 73 and/or the coupling control stub ~~can formed~~ optionally can be provided in this embodiment.

Please replace the paragraph that begins at page 27, line 10, with the following amended paragraph:

A further preferred embodiment of the present invention will now be ~~explained~~ described.

Please replace the paragraph that begins at page 27, line 12, with the following amended paragraph:

Figure 34 is a schematic perspective view from a top side showing a bandpass filter 80 that is a further preferred embodiment of the present invention. Figure 35 is a schematic plan view from a bottom side showing the bandpass filter 80.

Please replace the paragraph that begins at page 27, line 16, with the following amended paragraph:

As shown in Figures 34 and 35, the bandpass filter 80 that is a further preferred embodiment of the present invention is constituted of a dielectric block 81 and various metal plates formed on the surface thereof. The dielectric block 81 ~~is the same as~~ corresponds to the dielectric blocks 11, 51, 61 used in the bandpass filters 10, 50 and 60. That is, the dielectric block 81 is a rectangular prism.

Please replace the paragraph that begins at page 28, line 5, with the following amended paragraph:

As shown in Figure 34, an exciting electrode 84 is formed on the side surface 81e of the dielectric block 81 ~~being~~ which is in contact with the edge 81c; an exciting electrode 85 is formed on the side surface 81f of the dielectric block 81 ~~being~~ which is in contact with the edge 81d. These exciting electrodes 84 and 85 are prevented from contacting the metal plate 83 by the removed portions 87 and 88, respectively. No metal plate or electrode is formed on the remaining surfaces of the dielectric block 81[[,]] which, therefore, constitute open ends.

Please replace the paragraph that begins at page 28, line 18, with the following amended paragraph:

In the bandpass filter 80 of this embodiment, although the exciting electrodes 84 and 85 are formed on the side surfaces of the dielectric block 81, the exciting electrodes 84 and 85 can be directly connected to the electrodes formed on the printed circuit board by using [[a]]

solder or the like, without using wires, because the exciting electrodes 84 and 85 are in contact with the edges (81c and 81d) of the bottom surface of the dielectric block 81. That is, the bandpass filter 80 can be used as a SMD.

Please replace the paragraph that begins at page 28, line 25, with the following amended paragraph:

In this embodiment, although the triangular removed portion 86 ~~of triangular~~ is formed [[on]] at the upper[[-]] left corner of the metal plate 83, the position, shape and number of the removed portion 86 are not limited as explained with reference to Figures 11 to 19.

Please replace the paragraph that begins at page 29, line 11, with the following amended paragraph:

For example, in the above described embodiments, the dielectric blocks for the resonators and the evanescent waveguide are made of a dielectric material whose dielectric constant, ε_r is 33. However, a material having a different dielectric constant can be used according to the intended purpose.

Please replace the paragraph that begins at page 29, line 16, with the following amended paragraph:

~~Further, the dimensions of the dielectric blocks, metal plates and exciting electrodes~~ specified in the above-described embodiments are only examples. Dielectric blocks, metal plates and exciting electrodes having different dimensions can be used according to intended purposes.

Please replace the paragraph that begins at page 29, line 24, with the following amended paragraph:

Further, in the case where the exciting electrodes are disposed on the bottom surface of the dielectric block, the thickness thereof and the area required for mounting can be reduced. In

this case, because the sufficient external circuit coupling can be obtained, a very thin shape and broadband operation can be achieved simultaneously.